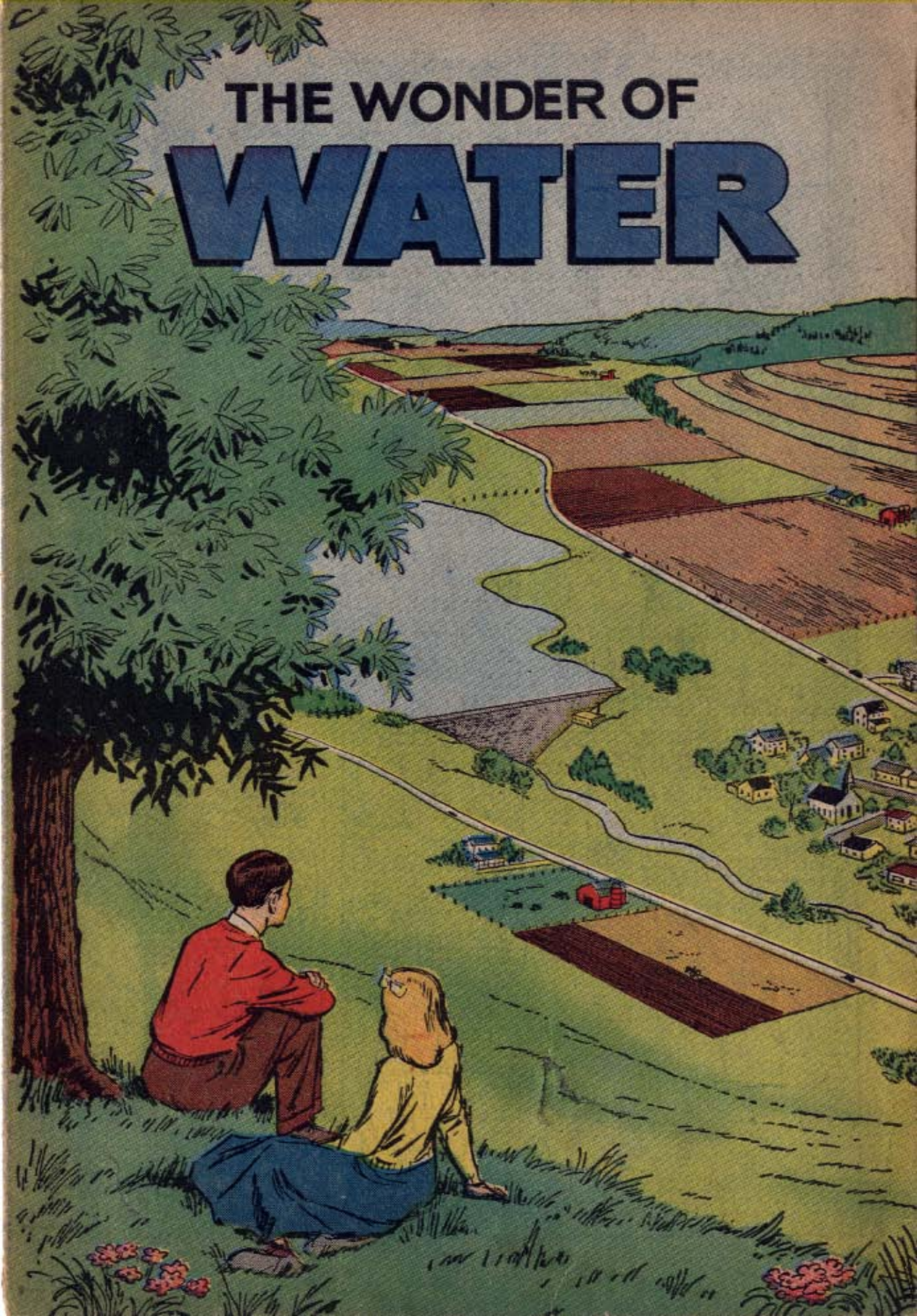
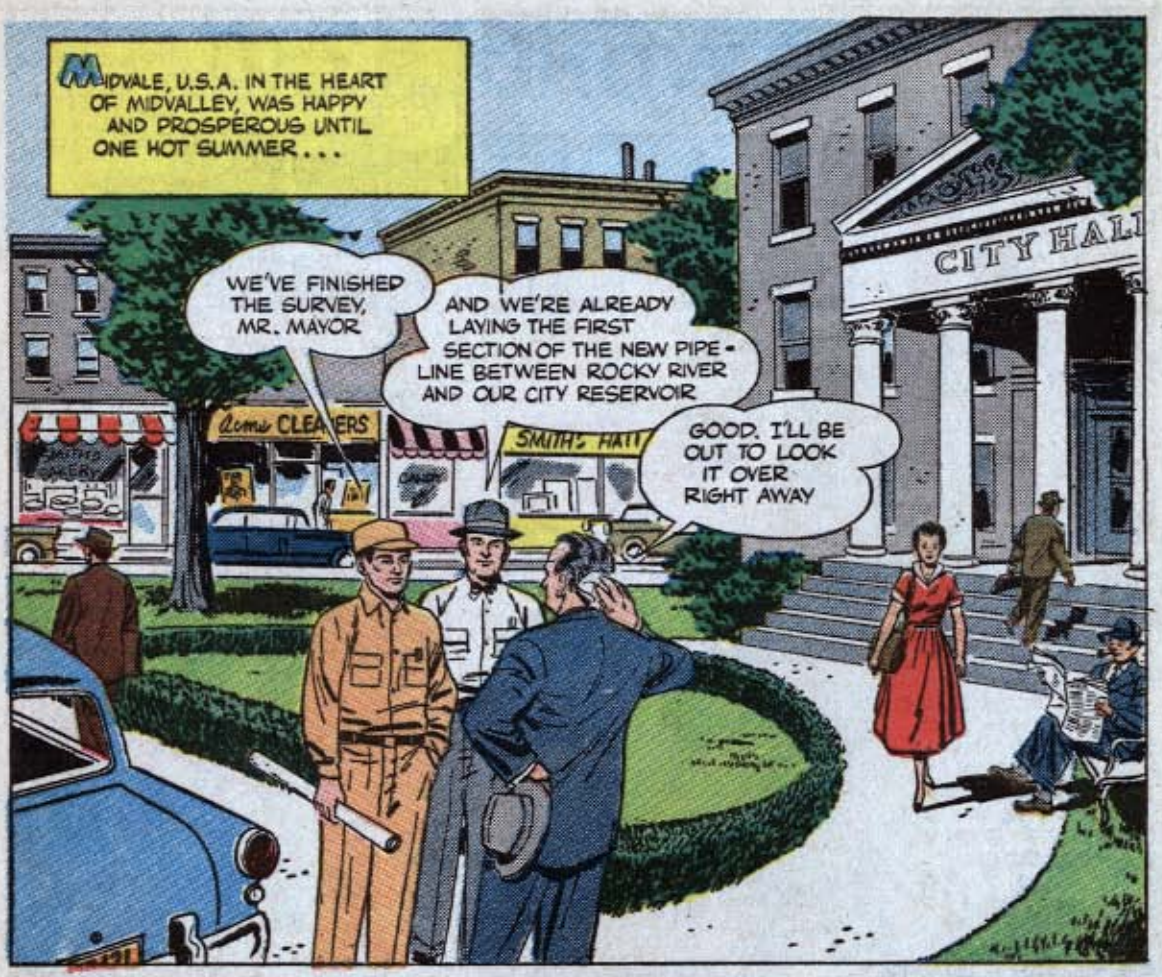
THE WONDER OF WATER





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MEANWHILE, IN OTHER PARTS OF MIDVALE . . .
NO WATER FOR THE LAWN. WE'LL JUST HAVE TO WATCH IT BURN UP
AND WE CAN'T EVEN WASH THE CAR

THE POOL IS EMPTY. THEY'VE CLOSED IT ON ACCOUNT OF THE DROUGHT
AND THE OL' SWIMMING HOLE ON INDIAN CREEK DRIED UP LAST WEEK, NO USE GOIN' THERE

I'M NOT IN THE MARKET FOR THAT NEW CORN PICKER, JIM. IN A FEW DAYS MY CORN CROP WILL BE LOST. MOST YEARS WE HAVE HAD ALL THE RAIN WE NEEDED, BUT...
I KNOW.. ALL THE FARMERS SAY THE SAME. THAT'S WHY I'M CLOSING UP EARLY
BATES & C
FARM
SUPPL

BUSINESS IS SO SLOW I'M GOING HOME AND TRY TO COOL OFF
I KNOW HOW YOU FEEL, JIM, THIS SHOULD BE MY BIG SEASON, BUT WHO WANTS BOATS WHEN THERE IS NO PLACE TO USE THEM!
SPORTS SHOP
SALE ½ PRICE

MEANWHILE, AT A MEETING OF THE CITY COUNCIL . . .
OUR RESERVOIR IS ALMOST DRY AND THE STREAM THAT FEEDS IT HAS STOPPED FLOWING
OUR MILL IS CLOSING DOWN! WHEN WILL THAT NEW PIPELINE BE READY?
WE'LL TRY TO HAVE IT DONE IN SIX WEEKS

OUR ESTIMATES CALL FOR 10 MILES OF PIPELINE AT $30,000 A MILE BUT WE MAY NEED MORE THAN $300,000 TO BE CERTAIN
I MOVE WE APPROPRIATE ANOTHER $50,000 RIGHT NOW
YOU'LL GET IT, MR. MAYOR!

WE DON'T THINK ABOUT WATER UNTIL WE HAVE A FLOOD OR A DROUGHT... AND THEN IT'S TOO LATE. I INTEND TO APPOINT A WATER COMMITTEE TO STUDY OUR PROBLEMS OVER THE LONG PULL

SO A COMMITTEE WAS FORMED, COMPOSED OF BUSINESS MEN, CIVIC LEADERS AND OFFICIALS
I DON'T THINK ANY OF US KNOWS ENOUGH ABOUT THE WATER PROBLEM
AS SCHOOL SUPERINTENDENT, I AGREE, MR. MAYOR...

AND I FEEL IT IS SOMETHING OUR YOUNG PEOPLE NEED TO STUDY, TOO. LET'S ADD A COUPLE OF THEM TO THE COMMITTEE AND SEE THAT WATER GETS DISCUSSED IN THE SCHOOLS
AN EXCELLENT IDEA. THEY'LL BE RUNNING THIS TOWN SOMEDAY AND WILL BE BETTER EQUIPPED WITH SUCH A BACKGROUND

AND NEXT DAY, AT MIDVALE HIGH SCHOOL...
A SPECIAL ASSEMBLY TO DISCUSS THE WATER SITUATION? THAT'S NOT OUR PROBLEM
WHY NOT? IT'S EVERYBODY'S PROBLEM IN MIDVALE
WE'RE SUPPOSED TO PICK TWO STUDENTS AS MEMBERS OF THE TOWN COMMITTEE. JACK GARDLE SHOULD BE ONE
SPECIAL ASSEMBLY

JACK'S DOING A GOOD JOB AS PRESIDENT OF THE STUDENT COUNCIL.. AND HE'S PLANNING TO BE AN ENGINEER

AND THERE'S SUE POST... SHE'S BEEN REAL POPULAR AS A CHEER LEADER. HER FATHER OWNS A FARM SO SHE'S MORE LIKELY TO UNDERSTAND THIS STUFF ABOUT WATER

SO JACK AND SUE WERE ELECTED AND WHILE WORKMEN FEVERISHLY SPED THE CONSTRUCTION OF THE PIPELINE...

THE JUNIOR MEMBERS OF THE WATER COMMITTEE PRESENTED THEIR IDEAS FOR LONG RANGE PLANNING...

WHY NOT HAVE ALL THE SCIENCE CLASSES TAKE UP A SPECIAL STUDY OF WATER?

AND AFTER A FEW WEEKS, THEY CAN TAKE UP INDIVIDUAL PROJECTS

THOSE ARE GOOD SUGGESTIONS. WE SHALL USE THEM

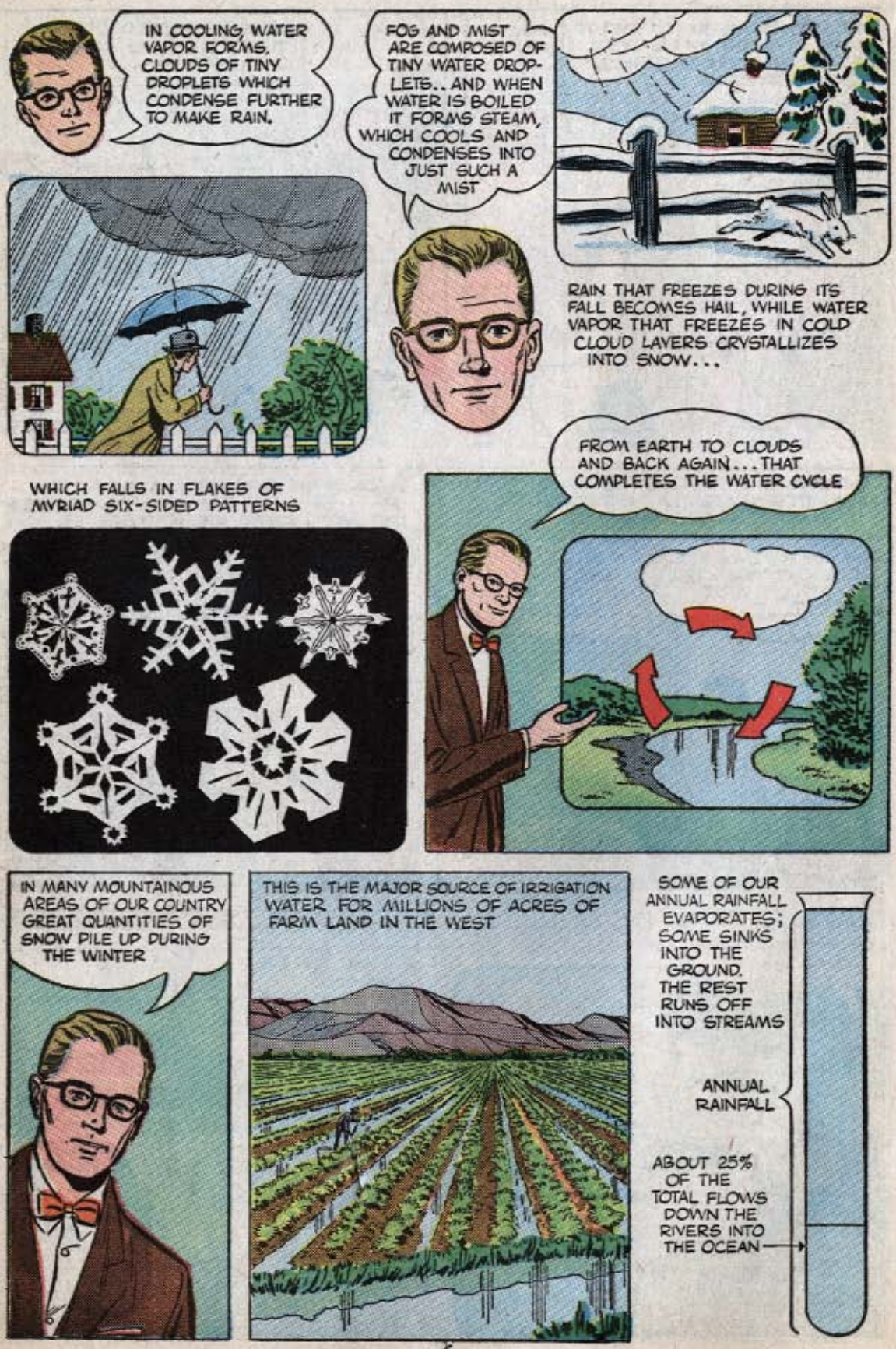
LATER IN THE CLASS ROOM...

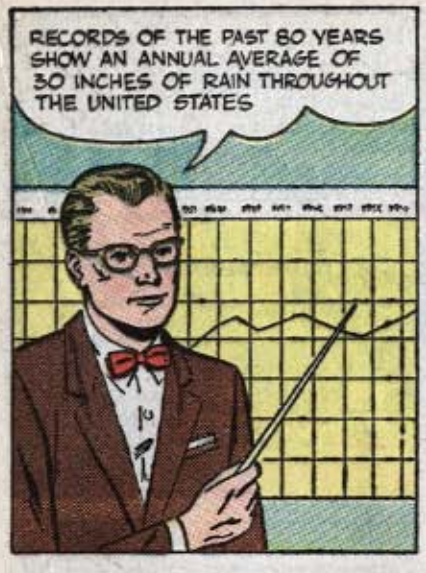
THE SLIDES YOU ARE ABOUT TO SEE ILLUSTRATE THE WATER CYCLE WHICH BEGINS WITH WATER IN THE LIQUID STATE, AS WE SEE IT IN LAKES...

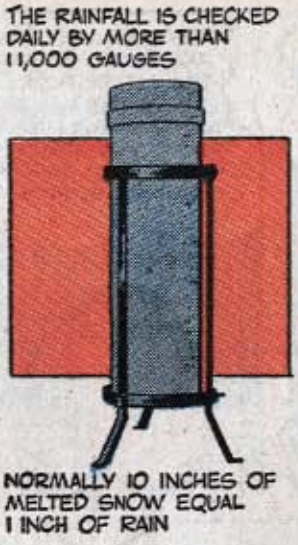
OR IN RIVERS WHICH FLOW INTO THE OCEAN

WATER EVAPORATES FROM LAKES, STREAMS, AND THE OCEAN AND TRANSPIRES FROM THE TREES AND PLANTS...

SPREADING INTO THE ATMOSPHERE IN THE FORM OF WATER VAPOR. THE HOTTER THE AIR, THE MORE WATER VAPOR IT CAN HOLD


IN COOLING, WATER VAPOR FORMS, CLOUDS OF TINY DROPLETS WHICH CONDENSE FURTHER TO MAKE RAIN.
FOG AND MIST ARE COMPOSED OF TINY WATER DROPLETS.. AND WHEN WATER IS BOILED IT FORMS STEAM, WHICH COOLS AND CONDENSES INTO JUST SUCH A MIST
RAIN THAT FREEZES DURING ITS FALL BECOMES HAIL, WHILE WATER VAPOR THAT FREEZES IN COLD CLOUD LAYERS CRYSTALLIZES INTO SNOW...
WHICH FALLS IN FLAKES OF MYRIAD SIX-SIDED PATTERNS
FROM EARTH TO CLOUDS AND BACK AGAIN... THAT COMPLETES THE WATER CYCLE
IN MANY MOUNTAINOUS AREAS OF OUR COUNTRY GREAT QUANTITIES OF SNOW PILE UP DURING THE WINTER
THIS IS THE MAJOR SOURCE OF IRRIGATION WATER FOR MILLIONS OF ACRES OF FARM LAND IN THE WEST
SOME OF OUR ANNUAL RAINFALL EVAPORATES; SOME SINKS INTO THE GROUND. THE REST RUNS OFF INTO STREAMS
ANNUAL RAINFALL
ABOUT 25% OF THE TOTAL FLOWS DOWN THE RIVERS INTO THE OCEAN

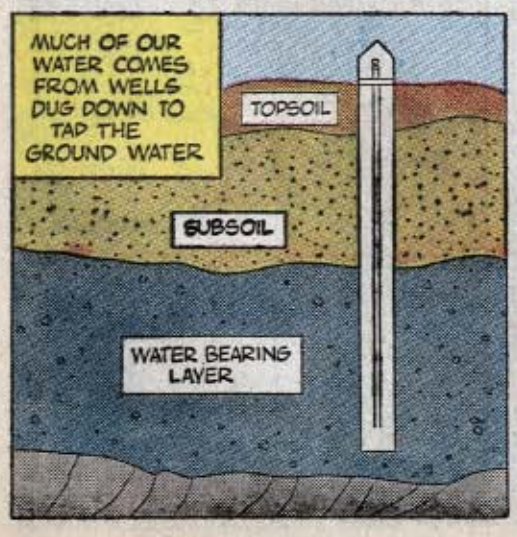

RECORDS OF THE PAST 80 YEARS SHOW AN ANNUAL AVERAGE OF 30 INCHES OF RAIN THROUGHOUT THE UNITED STATES

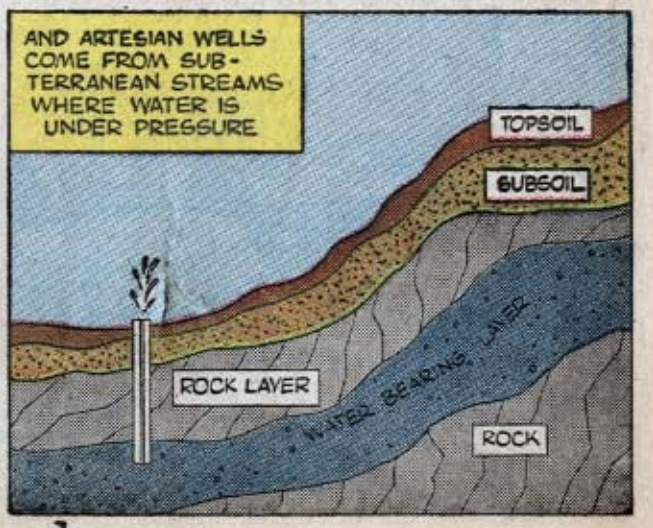

THE RAINFALL IS CHECKED DAILY BY MORE THAN 11,000 GAUGES
NORMALLY 10 INCHES OF MELTED SNOW EQUAL 1 INCH OF RAIN

WATER THAT SEEPS DOWN THROUGH THE GROUND AND FILLS UP SPACE ABOVE A HARD LAYER OF ROCK OR CLAY IS CALLED **GROUND WATER**
TOPSOIL
SUBSOIL
GROUND WATER IN THIS LAYER
ROCK OR IMPERVIOUS CLAY LAYER STOPS DOWNWARD MOVEMENT

MARSHES ARE FORMED WHEN THE GROUND IS SATURATED BY WATER...

WHILE WATER THAT HAS SOAKED INTO THE GROUND MAY EMERGE FROM HILLSIDES TO FORM SPRINGS

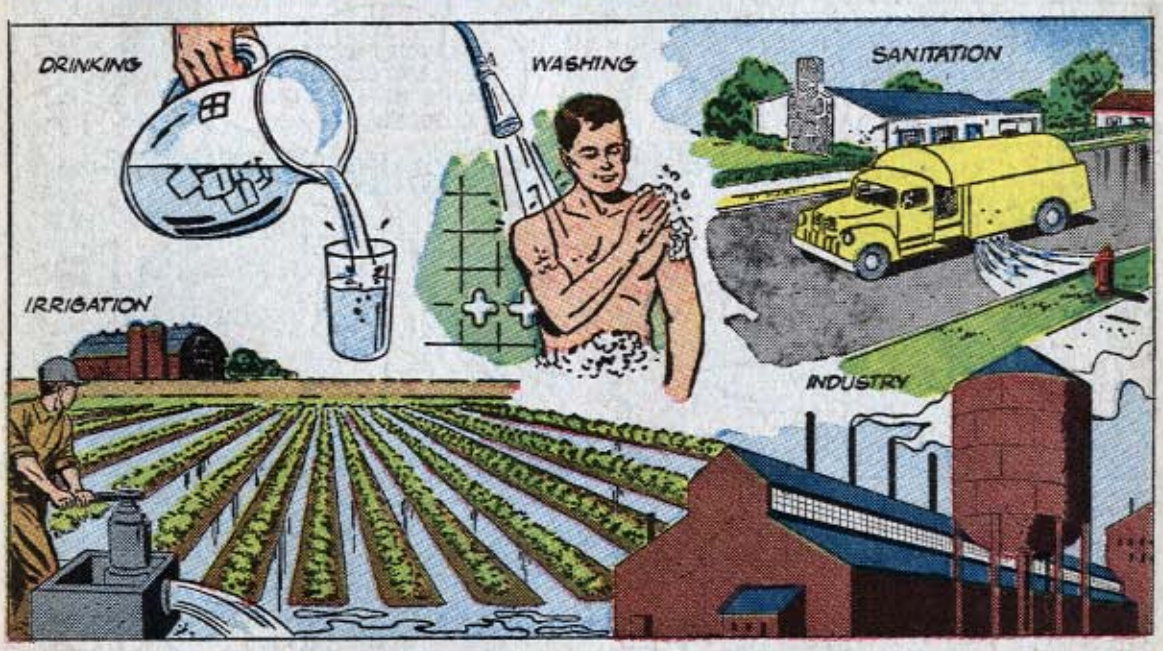

MUCH OF OUR WATER COMES FROM WELLS DUG DOWN TO TAP THE GROUND WATER
TOPSOIL
SUBSOIL
WATER BEARING LAYER

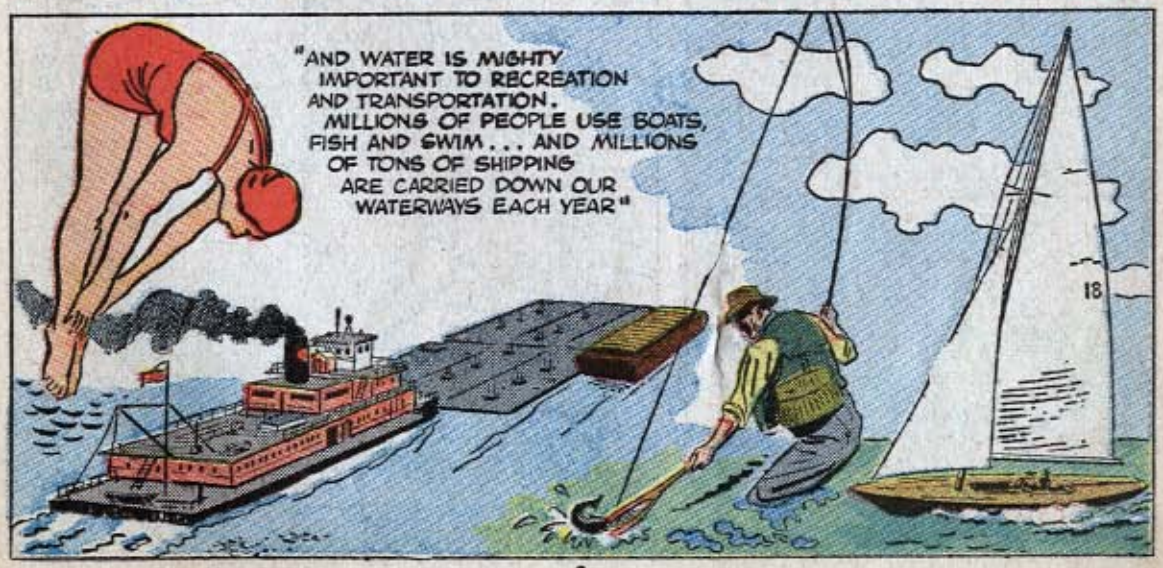

AND ARTESIAN WELLS COME FROM SUB-TERRANEAN STREAMS WHERE WATER IS UNDER PRESSURE
TOPSOIL
SUBSOIL
ROCK LAYER
WATER BEARING LAYER
ROCK

WHAT ABOUT MAKING RAIN? IS THAT POSSIBLE?
WELL, YEARS AGO FAKERS CALLED THEMSELVES RAINMAKERS AND SOLD A LOT OF GADGETS THAT NEVER WORKED
NOWADAYS, STUDY IS BEING MADE OF PROCESSES THAT MAY INCREASE OUR WATER SUPPLIES. WE'RE EXPERIMENTING WITH WAYS TO DISTILL SEA WATER ECONOMICALLY AND WE'RE TRYING "CLOUD SEEDING" AS A WAY OF INCREASING RAINFALL... BUT SUCH PROCESSES HAVE NOT BEEN PERFECTED
EVEN A RAINMAKER COULDN'T HELP MIDVALLEY! THERE'S NOT A CLOUD IN SIGHT!
OUR ONLY HOPE TEMPORARILY IS THE EMERGENCY PIPELINE. THERE'S TO BE A REPORT ON IT AT THE COMMITTEE MEETING
OUR WATER SUPPLIES ARE ALMOST GONE, SO I AM ISSUING A NEW RATIONING ORDER, FORTUNATELY, HOWEVER...
THE EMERGENCY PIPELINE HAS BEEN LAID HALF WAY TO ROCKY RIVER AND THE PUMPS WE ORDERED WILL SOON ARRIVE
HOWEVER, EVEN THE PIPELINE WILL NOT SUPPLY OUR NEEDS AS MIDVALE GROWS.. TAKE OUR LOCAL MILL... HOW MUCH WATER WOULD IT USE? DOES ANYONE HERE KNOW?
I DO MR. MAYOR

AS ONE OF OUR STUDY PROJECTS WE SENT A GROUP TO THE MILL. THEY LEARNED THAT IT TAKES 65,000 GALLONS OF WATER FOR EVERY TON OF STEEL MANUFACTURED
FINE, JACK, SUE, COULD YOU TELL US HOW THE REST OF OUR WATER IS USED?
CERTAINLY, MR. MAYOR

IN THE UNITED STATES 210 BILLION GALLONS OF WATER ARE USED DAILY, PRIMARILY IN THE FOLLOWING WAYS . . .

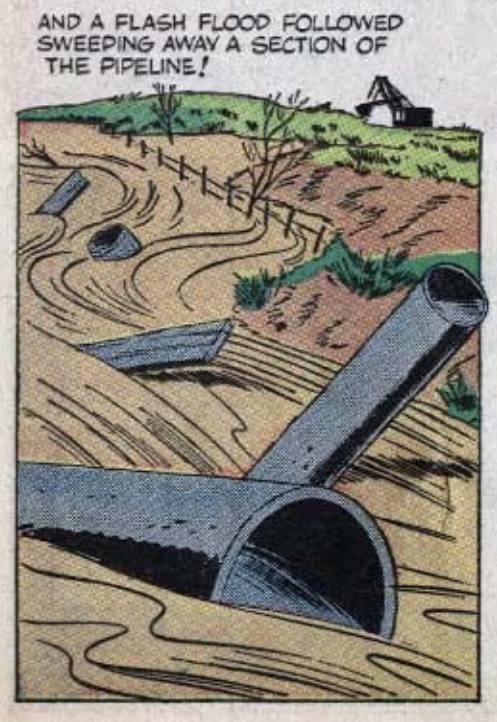

DRINKING
WASHING
SANITATION
IRRIGATION
INDUSTRY


"AND WATER IS MIGHTY IMPORTANT TO RECREATION AND TRANSPORTATION. MILLIONS OF PEOPLE USE BOATS, FISH AND SWIM . . . AND MILLIONS OF TONS OF SHIPPING ARE CARRIED DOWN OUR WATERWAYS EACH YEAR"
18

THANK YOU FOR THAT FINE REPORT JACK AND SUE. BE SURE TO COME TO THE NEXT MEETING, THE SOIL CONSERVATIONIST HAS PROMISED TO BE HERE

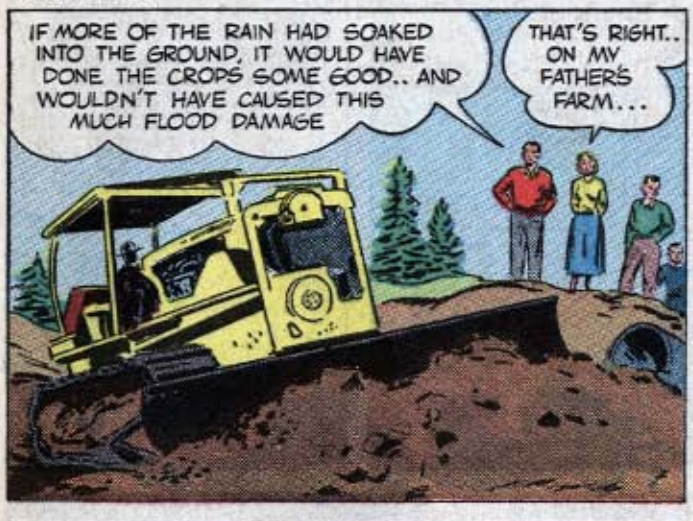
THEN..
LOOK AT THOSE STORM CLOUDS, SUE! MIDVALE WON'T NEED A RAINMAKER! WHY WE WON'T EVEN NEED OUR NEW PIPELINE
IF THAT STORM REALLY BREAKS WE MAY NOT HAVE A PIPELINE BUT WE'LL STILL NEED IT!

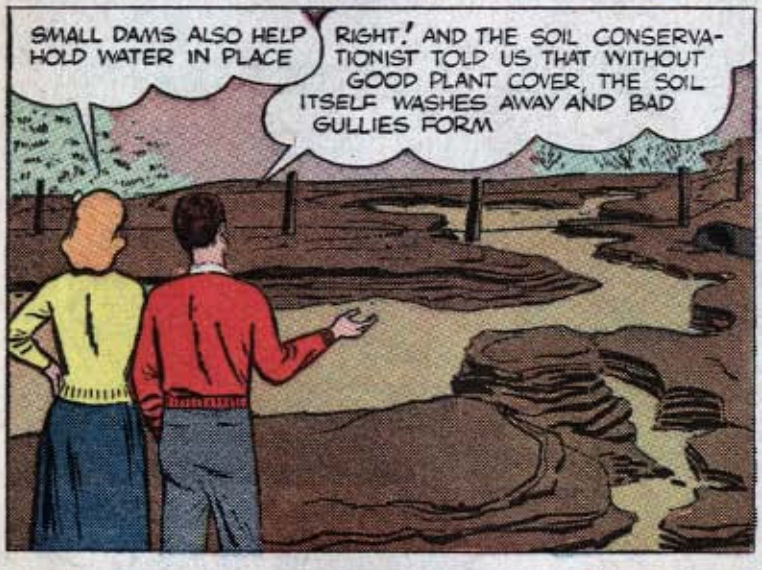
AND SUE WAS RIGHT... A TERRIFIC CLOUDBURST STRUCK BETWEEN MIDVALE AND ROCKY RIVER
HEAD FOR THE TRUCKS, MEN. IT LOOKS LIKE WE'RE IN FOR A REAL CLOUDBURST!


AND A FLASH FLOOD FOLLOWED SWEEPING AWAY A SECTION OF THE PIPELINE!

LATER..
WE WANTED WATER...AND WE GOT IT!
YES, FIRST IT WAS TOO LITTLE..THEN IT WAS TOO MUCH.. TOO BAD IT WASN'T IN THE RIGHT PLACE TO FILL MIDVALE RESERVOIR

AS THE WORKMEN BEGAN TO REPAIR THE PIPELINE HIGH SCHOOL STUDENTS CAME OUT TO STUDY THE DAMAGE...

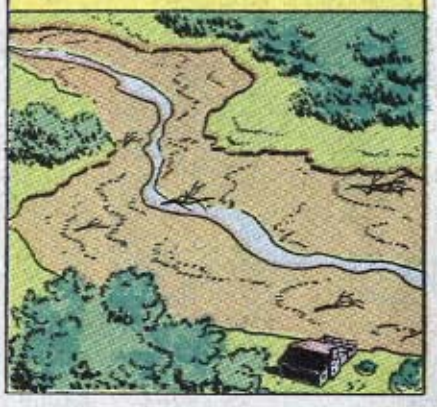




AT THE NEXT COMMITTEE MEETING...

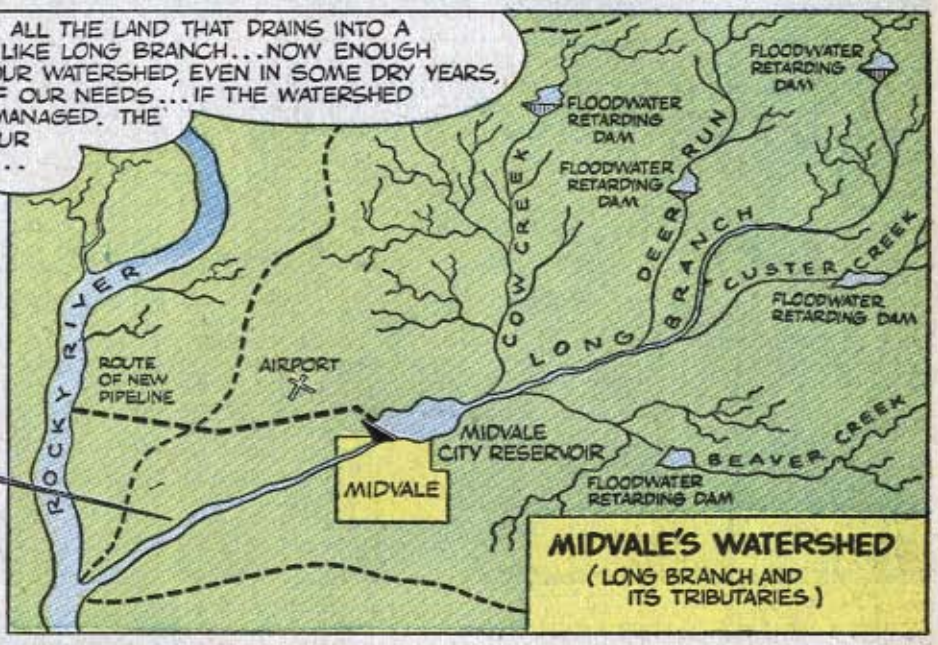
MULTIPLIED BY MILLIONS, THEY LOOSEN THE TOP-SOIL SO THAT RUNOFF CAN WASH IT AWAY AND FORM GULLIES...

CARRYING MUD AND SILT INTO THE RIVERS, CHOKING CHANNELS WITH DEBRIS, MAKING THE WATER LESS FIT FOR HUMAN AND INDUSTRIAL USE, AND SPOILING STREAMS FOR FISHING



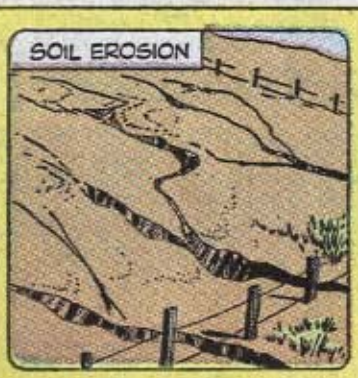
SOIL CONSERVATION ON FARM, RANGE, AND WOODLANDS IS THE BIG STEP IN MANAGING OUR WATER, SO WE'VE ASKED MR. CONKLIN, THE SOIL CONSERVATIONIST WHO WORKS WITH OUR LOCAL SOIL CONSERVATION DISTRICT, TO TELL HOW A WATERSHED PROTECTION PROGRAM CAN HELP US HAVE A BETTER WATER SUPPLY

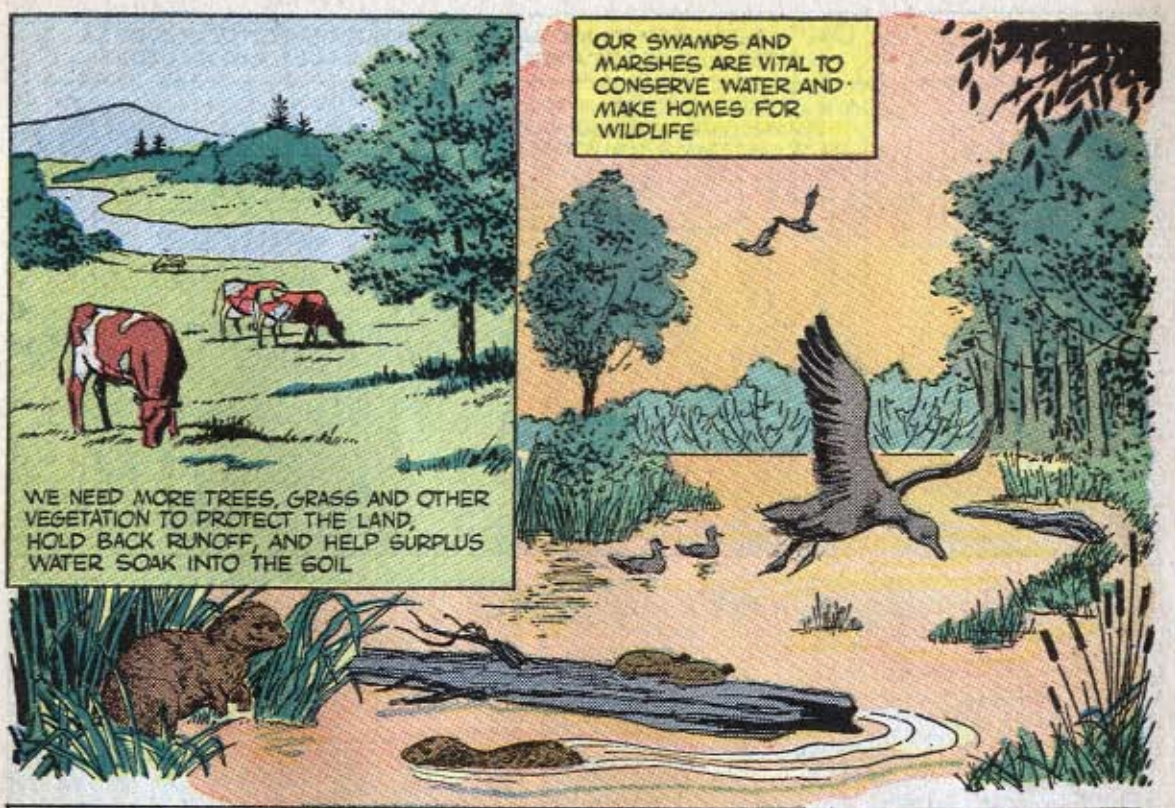
A WATERSHED IS ALL THE LAND THAT DRAINS INTO A SINGLE STREAM LIKE LONG BRANCH...NOW ENOUGH RAIN FALLS ON OUR WATERSHED, EVEN IN SOME DRY YEARS, TO TAKE CARE OF OUR NEEDS... IF THE WATERSHED WERE PROPERLY MANAGED. THE SOIL ITSELF IS OUR BEST RESERVOIR...



MIDVALE'S WATERSHED
(LONG BRANCH AND ITS TRIBUTARIES)

BUT IN A MISMANAGED WATERSHED, MOST OF THE WATER RUNS OFF AND CAN DO A LOT OF DAMAGE AS THESE SLIDES SHOW...




WE NEED MORE TREES, GRASS AND OTHER VEGETATION TO PROTECT THE LAND, HOLD BACK RUNOFF, AND HELP SURPLUS WATER SOAK INTO THE SOIL
OUR SWAMPS AND MARSHES ARE VITAL TO CONSERVE WATER AND MAKE HOMES FOR WILDLIFE

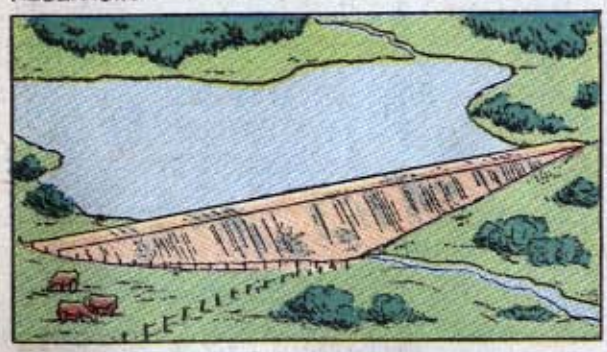
THAT MEANS WE MUST GET FARMERS WORKING WITH US IF WE'RE GOING TO SOLVE OUR WATER PROBLEMS HERE IN MIDVALE!
EXACTLY...THESE ARE FIRST OF ALL PROBLEMS OUT ON THE LAND WHERE FARMERS AND RANCHERS LIVE. WHAT HAPPENS ON THEIR FARMS AND RANCHES DETERMINES LARGELY WHAT HAPPENS TO OUR WATER. THE THINGS WE DO TO HELP PROTECT THE LAND ARE THE VERY THINGS THAT PROTECT YOUR CITY WATER SUPPLY AND PREVENT FLOODS
BUT THESE PROBLEMS ARE TOO BIG FOR A SINGLE FARMER TO HANDLE. THEY NEED TO BE DEALT WITH IN THE WATERSHED AS A WHOLE. BY TEAMING UP TO TACKLE LAND AND WATER PROBLEMS ALL OVER THE WATERSHED, PEOPLE WILL SOLVE THE PROBLEM, BETTER AND QUICKER

REPAIRS WERE RUSHED ON THE EMERGENCY PIPELINE. IT FINALLY REACHED THE ROCKY RIVER

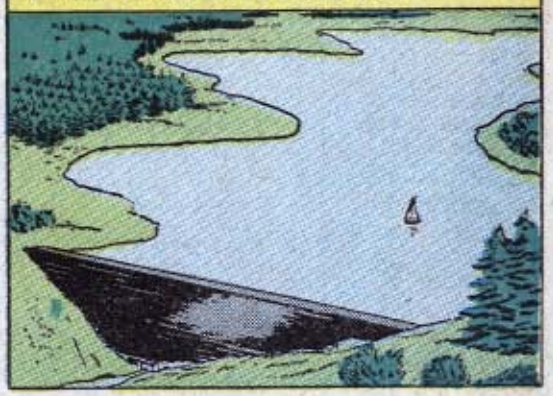
AND A FEW DAYS LATER, A BIG CELEBRATION WAS HELD AT THE MIDVALE RESERVOIR
HERE COMES THE WATER!
AND THAT SOLVES OUR IMMEDIATE WATER PROBLEM, BUT THE NEW PIPELINE WON'T MEET OUR NEEDS LONG. WE NEED TO DO SOMETHING TO INSURE THAT AS MIDVALE GROWS, OUR WATERSHED WILL PROVIDE THE KIND AND AMOUNT OF WATER WE NEED

SO I'VE ASKED THE SUPERVISORS OF THE SOIL CONSERVATION DISTRICT TO MEET WITH OUR COUNCIL AS A STEP TO GET FARMERS AND TOWNSPEOPLE TOGETHER!
ONE MEETING LED TO ANOTHER, AND FINALLY, THE PEOPLE ORGANIZED A WATERSHED ASSOCIATION TO SPONSOR A WATERSHED PROJECT
WE ARE NOW ON OUR WAY TOWARD A PERMANENT SOLUTION TO OUR WATER PROBLEM.. AND I WANT TO THANK YOU FOR THE PART THE YOUNG PEOPLE HAVE PLAYED IN IT
MIDVALE WATERSHED ASSOCIATION
FROM AN AERIAL SURVEY, MAPS WERE MADE AND PLANS DRAWN
THE PLAN STARTED WITH SOIL AND WATER CONSERVATION WORK ON THE FARM LANDS...TERRACES AND GRASSED WATERWAYS TO CONTROL SURPLUS WATER...
FARM PONDS TO HOLD SOME OF THE WATER FOR LIVESTOCK USE, AND FOR FISH AND RECREATION
STRIPCROPPING AND CONTOUR CULTIVATION TO SLOW DOWN RUNOFF AND MAKE MORE OF IT SEEP INTO THE GROUND

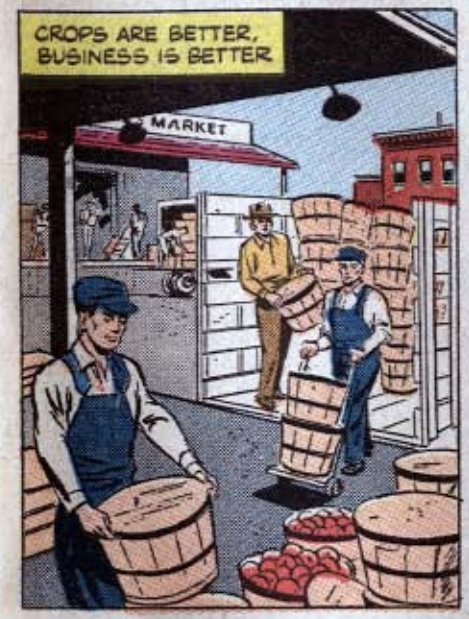
SEVERAL SMALL DAMS WERE BUILT TO CATCH FLOOD PEAKS AND RELEASE WATER IN A SAFE, CONTROLLED VOLUME. TWO WERE MULTIPLE PURPOSE DAMS AND ALSO STORED WATER TO SUPPLEMENT MIDVALE'S RESERVOIR



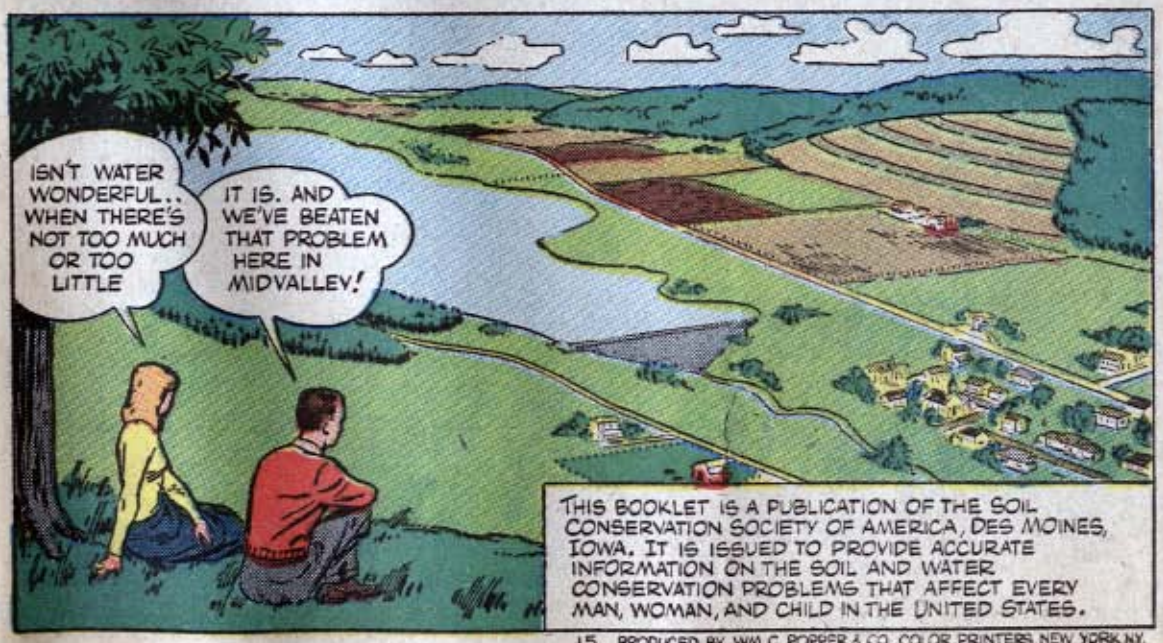
MIDVALE'S CITY RESERVOIR HAS A STEADY INFLOW OF SILT-FREE WATER NOW



CROPS ARE BETTER, BUSINESS IS BETTER



MIDVALE IS GROWING, WITH ASSURANCE THAT A WELL MANAGED WATERSHED WILL PROTECT ITS PEOPLE AND ITS BUSINESS FROM TOO LITTLE OR TOO MUCH WATER



THIS BOOKLET IS A PUBLICATION OF THE SOIL CONSERVATION SOCIETY OF AMERICA, DES MOINES, IOWA. IT IS ISSUED TO PROVIDE ACCURATE INFORMATION ON THE SOIL AND WATER CONSERVATION PROBLEMS THAT AFFECT EVERY MAN, WOMAN, AND CHILD IN THE UNITED STATES.

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